What is claimed is:

1. A method of optimizing a shape of an aperture comprising:

dividing an effective light source into a plurality of minute areas having same shape and size;

providing one point light source at a center of each of the divided minute areas;

obtaining a normalized image light intensity slope on a wafer in consideration of a focus variation of a projection aligner for a plurality of patterns at each of the point light sources;

using the normalized image light intensity slope of a light intensity as an index, which is related to an exposure amount variation of the projection aligner by one dimensional function;

selecting a common opening for the shape of the aperture that is optimized for each of the patterns; and

making the common opening into an optimum shape of the aperture for the patterns.

2. A method of optimizing a shape of an aperture comprising:

dividing an effective light source into a plurality of minute areas each having same shape and size;

providing one point light source at a center of each of the divided minute areas;

selecting a point light source having a high margin with

respect to the focus variation and the exposure amount variation of a projection aligner;

obtaining an aggregate of the point light sources and a plurality of normalized image light intensity slopes of each 5 of the point light sources;

in each of first to fourth image limits on an effective light source coordinate, removing the point light source that is not capable of being attained when tracing on the aggregate of the point light sources from the point light source having 10 a maximum value of the normalized image light intensity slopes in the smallest interval or $\sqrt{2} \times$ the smallest interval;

on the effective light source coordinate, defining a circle passing through the point light source that is closest to an origin, as an inner diameter of an aperture opening;

15 on the effective light source coordinate, defining a circle passing through the point light source that is farthermost from the origin, as an outer diameter of an aperture opening;

in each image limit on the effective light source coordinate, defining a point light source position having the 20 highest value of the normalized image light intensity slopes, as a center of a fan-like aperture type of each image limit;

defining a line in parallel with a first line passing through the point light source, angle of direction of which is furthermost in a positive direction from the first line 25 connecting the center of the fan-like aperture and the origin,

as a second line;

defining a line in parallel with a first line passing through the point light source, angle of direction of which is furthermost in a negative direction from the first line connecting the center of the fan-like aperture and the origin, as a third line; and

defining a range that is encircled by the inner diameter and the outer diameter of the aperture opening, the second line, and the third line, as an aperture opening of each image limit.

3. A method of optimizing a shape of an aperture comprising:

dividing an effective light source into a plurality of minute areas each having same shape and size;

providing one point light source at a center of each of the divided minute areas;

selecting a point light source having a high margin with respect to the focus variation and the exposure amount variation of a projection aligner;

obtaining an aggregate of the point light sources and a plurality of normalized image light intensity slopes of the point light sources;

in each of first to fourth image limits on an effective light source coordinate, removing a point light source that is not capable of being attained when tracing on the aggregate of the point light sources from the point light source having

the maximum value of the normalized image light intensity slopes

in the smallest interval or $\sqrt{2} \times$ the smallest interval;

defining a point light source position having the highest

value of the normalized image light intensity slopes as a center

5   of each image limit; and

defining a range that is encircled by a circle with a radius

as a line connecting the center point of the circle and the farthest

point light source in each image limit and a circle drawn by

the maximum σ of the projection aligner as an aperture opening

10   of each image limit.

4. A method of optimizing a shape of an aperture comprising:

dividing an effective light source into a plurality of

minute areas each having same shape and size;

providing one point light source at a center of each of

15   the divided minute areas;

selecting a point light source having a high margin with

respect to the focus variation and the exposure amount variation

of a projection aligner;

obtaining an aggregate of the point light sources and the

20   normalized image light intensity slopes of the point light

sources;

in each of first to fourth image limits on an effective

light source coordinate, removing a point light source that is

not capable of being attained when tracing on the aggregate of

25   the point light sources from the point light source having the

maximum value of the normalized image light intensity slopes in the smallest interval or $\sqrt{2} \times$ the smallest interval;

in each image limit, defining a circle passing through the point light source that is closest to an origin as an inner

5   diameter of a fan-like aperture opening;

in each image limit, defining a circle passing through the point light source that is farthermost from the origin, as an outer diameter of the fan-like aperture opening;

defining a line connecting a point light source having

10   the maximum slope and the origin among lines connecting each point light source and the origin, as a first line in each image limit;

defining a line connecting a point light source having the smallest slope and the origin among lines connecting each

15   point light source and the origin, as a second line in each image limit; and

defining a range that is encircled by the inner diameter and the outer diameter of the fan-like aperture opening, the first line, and the second line, as an aperture opening of each

20   image limit.